Pacific Ocean Tropical Synoptic Regimes & their Effect & Importance on the Globe

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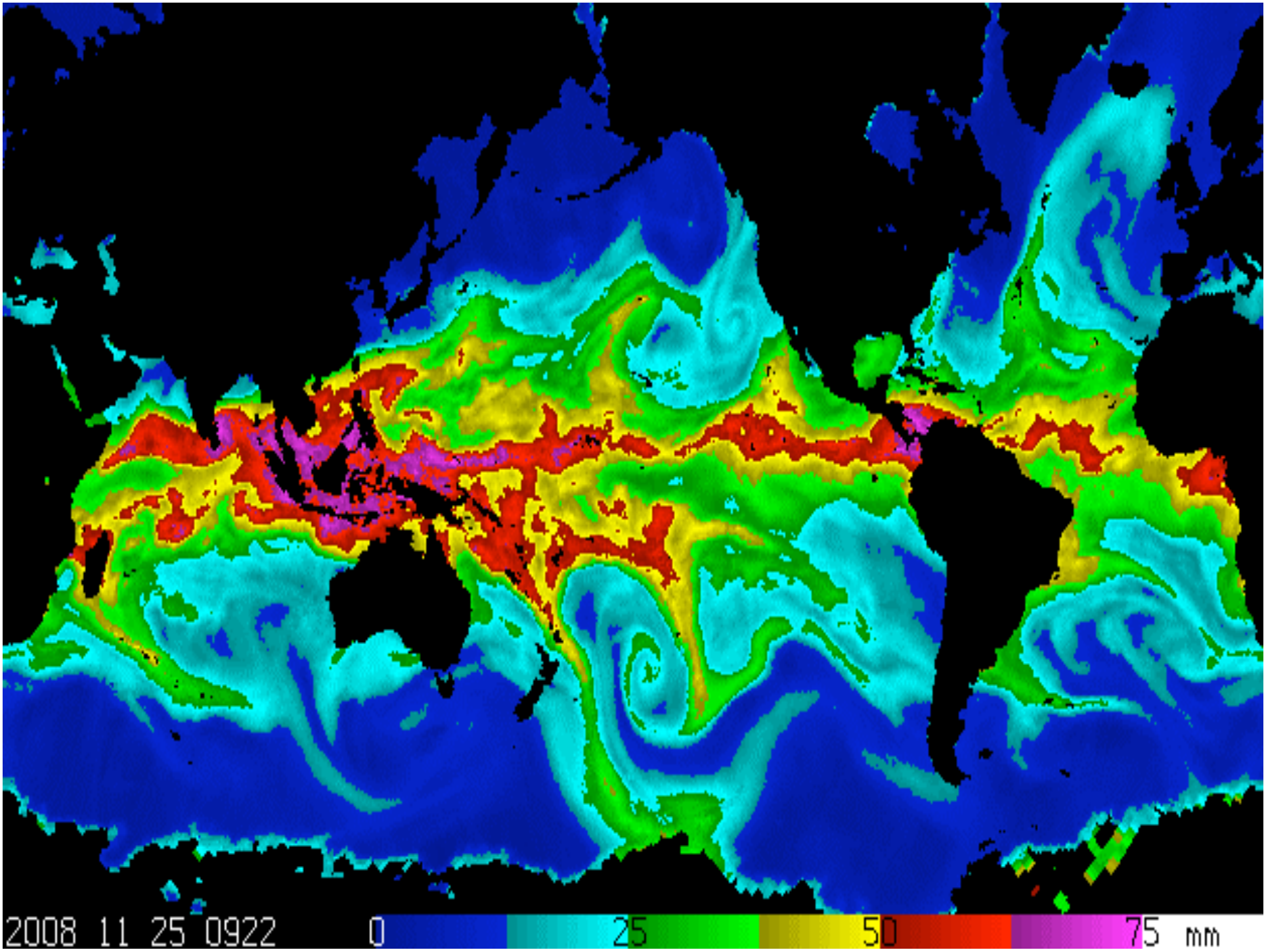
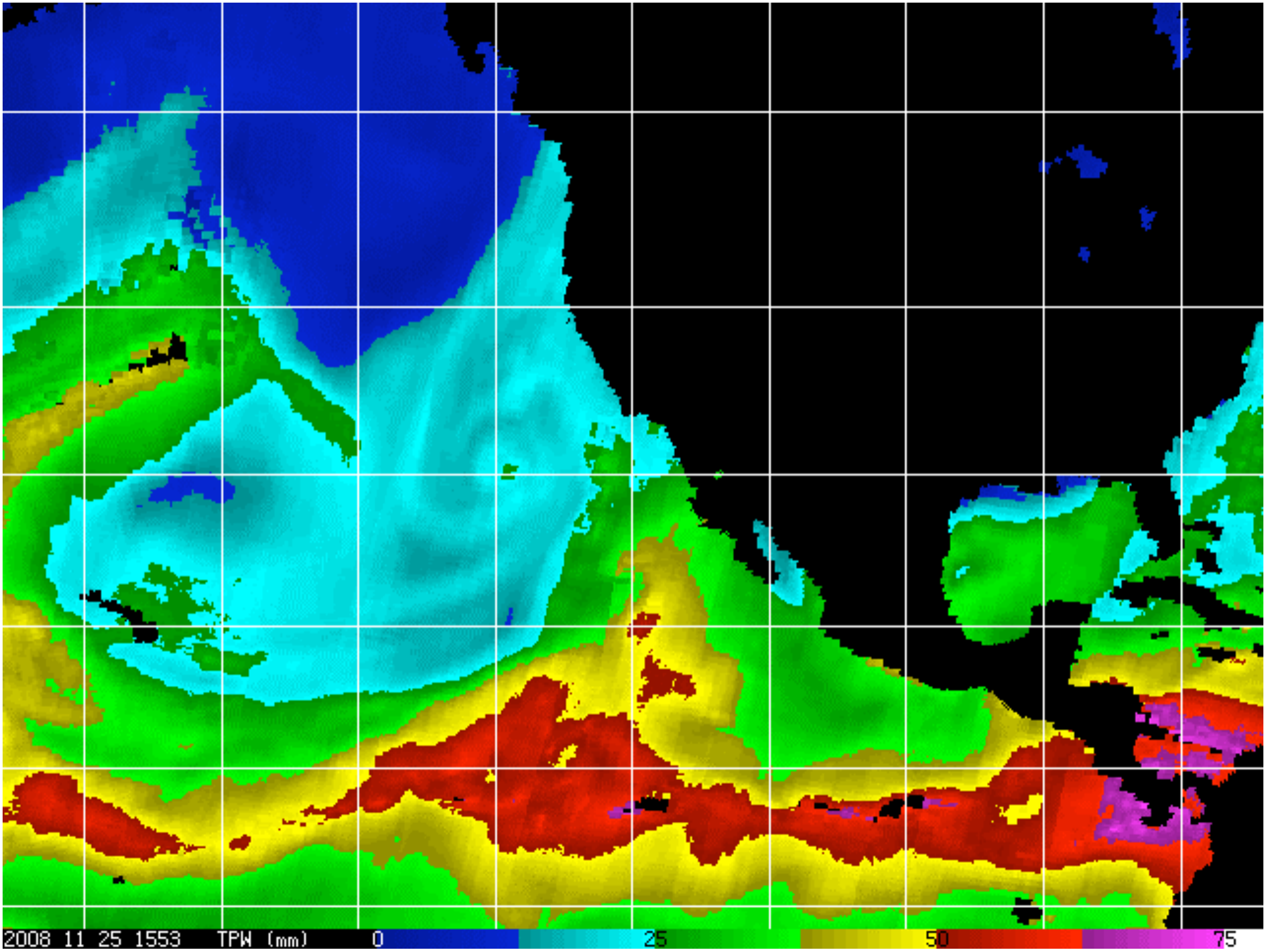
Outline

- Atmospheric Rivers
  - CIRA TPW Images
- Understanding of moisture transport
  - Summer monsoon depiction
  - Tropical Cyclone
  - Kona Low
- TUTT Effects
  - TUTT image
- Data Quandaries
- What's Next?

Atmospheric Rivers

- Poleward transport of moisture from the deep tropics
- Affects to the U.S. West Coast and Hawaiian Islands

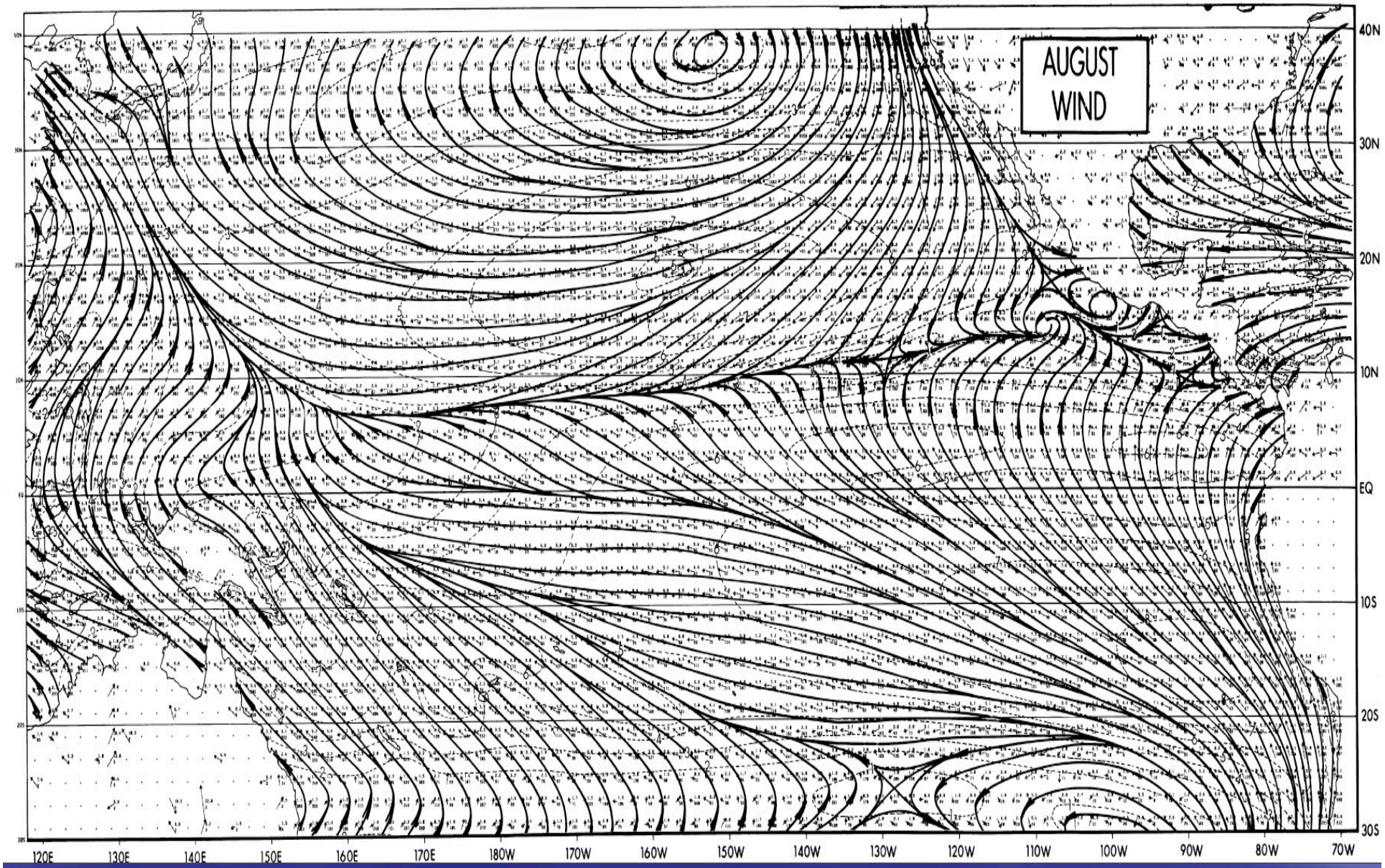

2008 11 25 0922
0
25
50
75
mm


2008 11 25 1553 TPW (mm) 0 25 50 75

Debris flow that initiated from large landslide above the town of La Conchita. Debris-flow source is from large 1995 landslide. (Courtesy USGS)

Understanding of moisture transport

- Interconnection of mid latitude patterns and the TUTT
- Many phenomena not understood
  - Vertical transport
    - MJO
    - NECZ (Tropical Regimes)
    - Summer monsoon
  - Meridional transport
    - TUTT & TUTT Cells
    - Tropical cyclones
    - Mid latitude storms



TROPICAL MARINE CLIMATIC ATLAS, Volume II, Pacific Ocean

J.C. Sadler, M.A. Lander, A.M. Hori, and L.K. Oda
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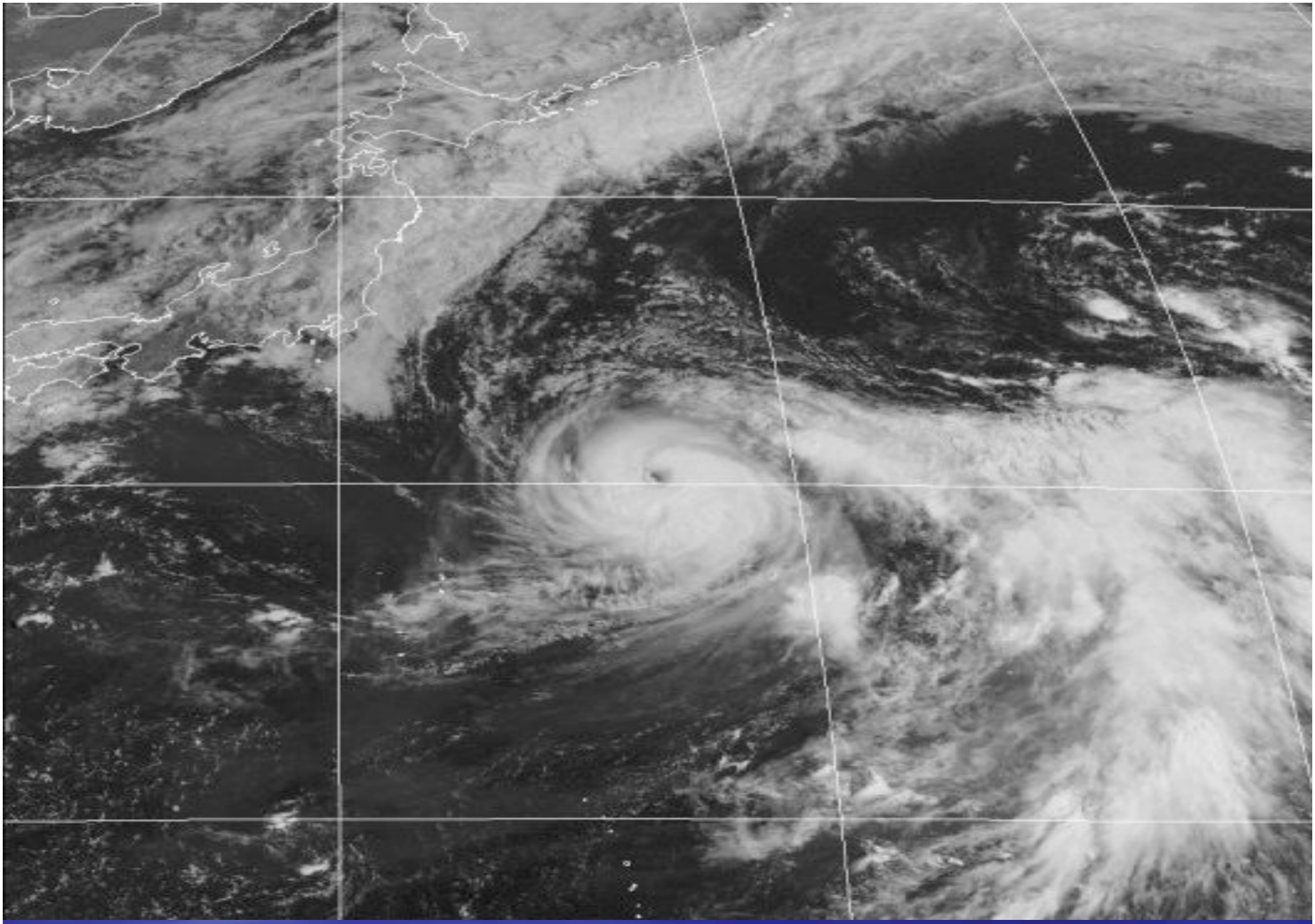
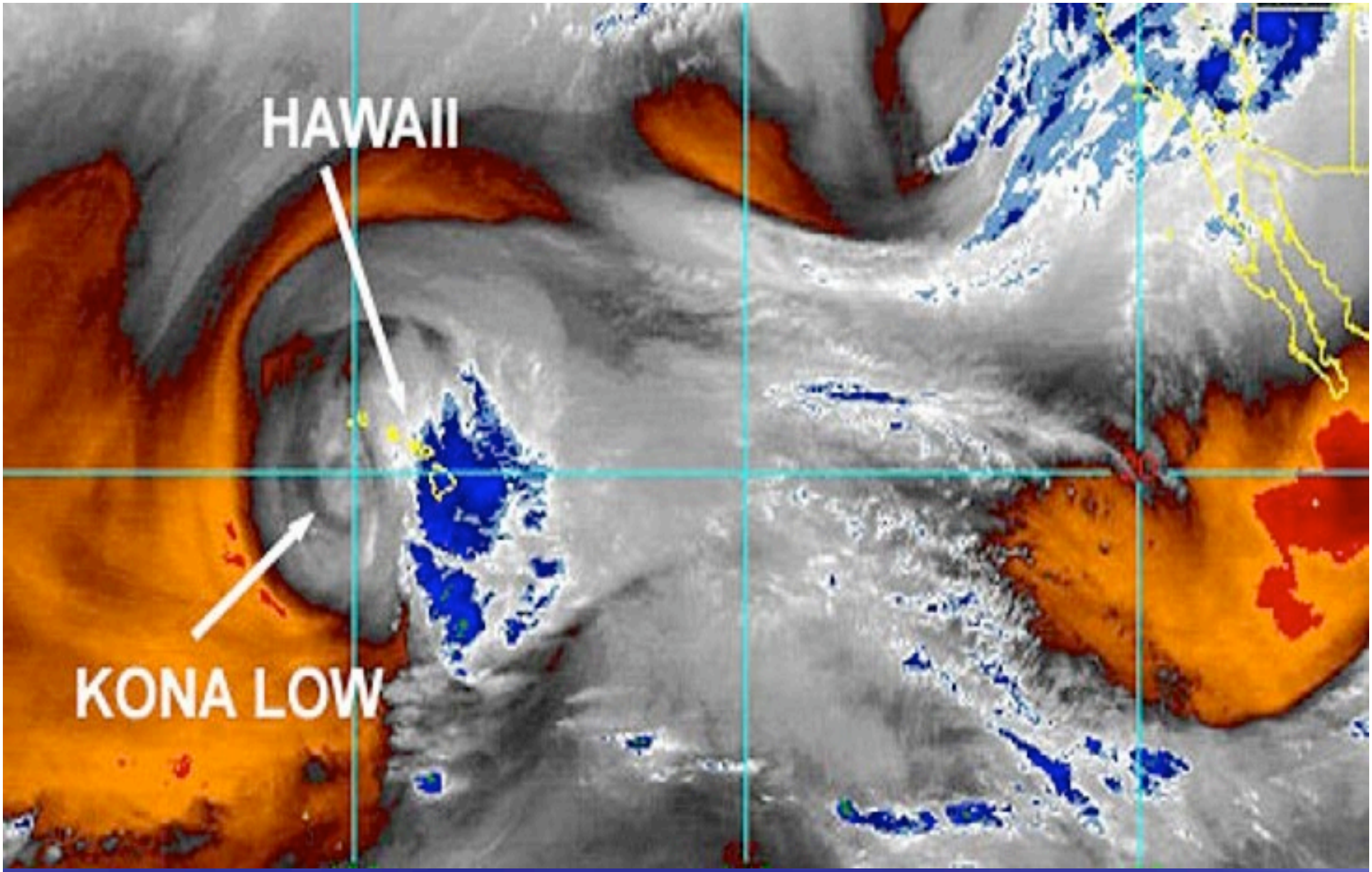


Figure 3-06-2. Visible satellite image of TY Rex at 312334Z August, 1998 undergoing reintensification to a 100 kt cyclone after weakening to 90 kt. (1988 ATCR)



A Kona low lashed the Hawaiian Islands on December 29, 2003. The bluish blob east Of the system's center represents the tops of convective clouds. Courtesy of the Cooperative Institute of Research in the Atmosphere at Colorado State University

TUTT Effects

- Develops in the Spring and extends through the Fall
  - Tropical Cyclones
    - Development
    - Track
    - Intensity
- Transports upper level moisture
- TUTT Cell
  - May reach surface
  - Tropical Cyclone affects

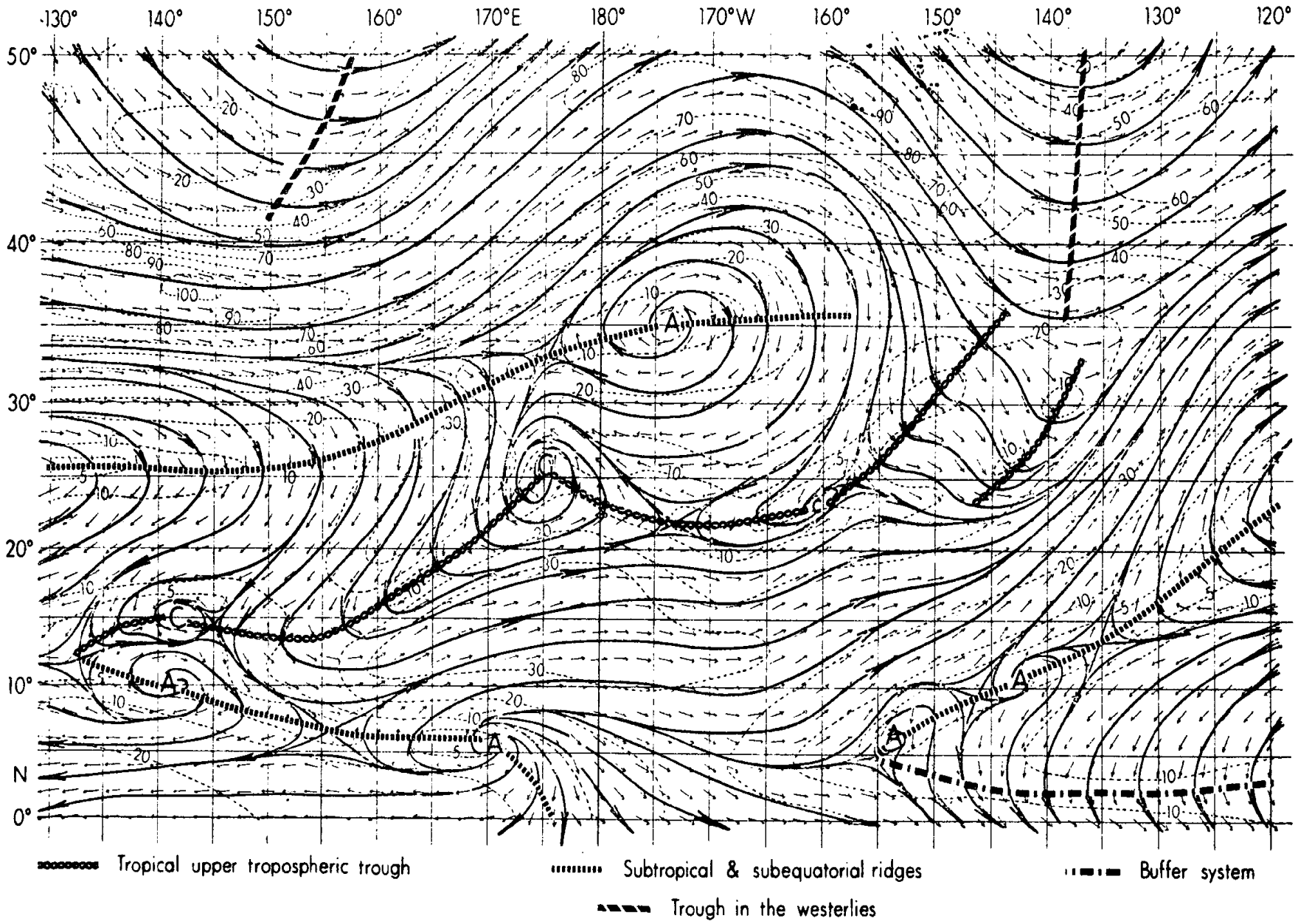


FIG. 2. The mean 250 mb circulation during the period of 13–24 June 1971. Wind speed (kt) shown by dashed lines.

Data Quandaries

- Pacific Region is data sparse
  - GPS sensors
  - Automated data sites
  - Wind Profilers
- Importance of MJO, TUTT, Tropical Regimes, Subtropical & Mid Latitude Phenomena
  - Vertical transport of moisture
  - Meridional transport
  - Mid lat systems

What's next?

- Past, Present & Future research required
  - Data requirements
  - Modeling
  - Training

Thank You

QUESTIONS???

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